

In the Claims

A complete listing of all remaining claims of the application follows:

Claim 1. (Currently amended) Device for leak-tight sealing of packaging containers for products sensitive to ambient pollutants ~~and for purification treatment of ambient air in these packaging containers,~~ with controlled amplitude of the opening angle and mechanically assisted opening and closing, to be installed on the tubular casing of the access opening to said container, said device being made in one piece of thermoplastic polymer materials and comprising:

- a leak-tight sealing means of the access opening of the container, ~~with a means of packaging an ambient air treatment agent on its inner face~~
- a means of assembly of the sealing means onto the tubular casing of the access opening,
- a connection means between the sealing means and the assembly means,
- a first opening tamper resistance means, placed between the sealing means and the assembly means, wherein said ~~resistance means~~ device comprises:
 - a) a male type stopper-cap as the sealing means of the opening

in the tubular casing of the container, composed of an upper end wall on which a first coaxial peripheral wall is mounted setting up a leak-tight contact with the inner surface of the tubular casing of the container access opening, ~~and a second wall internal to the first wall, forming the packaging means for the ambient air treatment agents,~~

b) as assembly means of the sealing means, an assembly ring mounted on the tubular casing of the container access opening, the inner face of which is provided with a means of attachment of the outer face of the casing,

c) as connection means between the assembly means and the sealing means, two distinct hinges at a spacing from each other, wherein the two distinct hinges comprise film hinges, each of which is formed of two parts forming brackets joined together by a polymer film acting as an axis of rotation allowing the opening/closing cycles of the sealing means, one of the parts being integrated into the sealing means with the other part integrated into the assembly means,

d) as first opening tamper resistance means, a peripheral series of connecting micro-dots or a peripheral strip to be torn off, or a combination of these two means placed between the sealing means and the assembly means so that a lower peripheral surface of the sealing means is joined to an upper peripheral surface

of the assembly means,

e) a mechanical assistance means for opening and closing and controlling the amplitude of the opening angle of the sealing means, placed in the space located between the two hinges and simultaneously connected to the stopper-cap through a further film hinge, and to the attachment ring fastening the device onto the casing by another film hinge, the section through the said mechanical assistance means being in the form of a bracket, wherein, when viewed in a diametric section passing between the film hinges of the connecting means, the another film hinge of the mechanical assistance and the part of the bracket joined to the assembly means are radially offset so as to be internal to the parts of the film hinges of the connecting means, which are integrated with the assembly means.

Claim 2. (Previously presented) Device according to claim 1, wherein the cross-section of the first coaxial peripheral wall of the sealing means setting up the leak-tight contact with the inner surface of the tubular casing of the opening of the container includes a peripheral swelling developing on an outer face thereof.

Claim 3. (Previously presented) Device according to claim 2, wherein the outer peripheral swelling of the first wall is

deformed when in contact with the inner wall of the tubular casing of the opening to increase the contact surface area between these two walls and to reinforce the leak-tightness.

Claim 4. (Currently amended) Device according to claim ~~1~~ 29, wherein the packaging means of ambient air treatment agents, placed on the inner face of the stopper-cap is tubular.

Claim 5. Cancelled

Claim 6. (Currently amended) Device according to claim ~~1~~ 29, wherein the packaging means of ambient air treatment agents, contains treatment agents capable of eliminating gaseous pollutants, water vapour, oxygen (O₂), ammonia (NH₃), alcohols, aldehydes, ketones, sulphur dioxide (SO₂), hydrogen sulphide (H₂S), mercaptans, alkenes, alkynes, carbon dioxide (CO₂), carbon monoxide (CO), nitrogen dioxide (NO₂), alkanes, halogens, and/or bacteria present in the ambient air.

Claim 7. (Previously presented) Device according to claim 6, wherein when the pollutant is water vapour, the treatment agent is selected from the group consisting of silica gels and molecular sieves in powdery form or deposited on a powdery support.

Claim 8. (Previously presented) Device according to claim 1, wherein the stopper-cap is provided with a gripping visor.

Claim 9. (Previously presented) Device according to claim 1, wherein the stopper-cap is provided with a child opening safety system.

Claim 10. (Previously presented) Device according to claim 9, wherein the safety system is installed adjacent to the visor.

Claim 11. (Previously presented) Device according to claim 9, wherein the opening safety system is a flexible strip surrounding the visor and forming an integral part of the assembly means.

Claim 12. (Previously presented) Device according to claim 1, wherein the inner face of the stopper-cap outer wall and the outer face of the outer wall of the tubular casing of the access opening of the container are provided with a click fit means.

Claim 13. (Previously presented) Device according to claim 1, wherein the assembly means of the stopper-cap is an attachment ring mounted on the tubular casing of the access opening, provided with a click fit means on its inner face facing

the outer face of the tubular casing, on which there is also a click fit means.

Claim 14. (Previously presented) Device according to claim 1, wherein the assembly means is force fitted on the tubular casing.

Claim 15. (Previously presented) Device according to claim 1, wherein the assembly means is mounted by bonding on the tubular casing.

Claim 16. (Previously presented) Device according to claim 1, wherein the outer peripheral surface of the tubular casing of the access opening to the container to be sealed comprises two projecting peripheral collars, separated from each other by creating a groove with an approximately rectangular shaped section, the thickness of the tubular casing inside the groove is not modified, and the attachment ring is force fitted into the said groove.

Claim 17. (Previously presented) Device according to claim 1, wherein a peripheral groove that may have an approximately rectangular, hemispherical or semi-elliptical shaped section, is made recessed within the thickness of the wall of the tubular casing of the container, the thickness of the

tubular casing inside the groove being modified, and being less than the thickness of the tubular casing and the attachment ring force fitted into the said groove.

Claim 18. (Previously presented) Device according to claim 16, wherein the inner surface of the attachment ring is provided with click fit means which, when the said attachment ring is force fitted into the groove of the container, itself equipped with complementary click fit means, fits into the corresponding click fit means so as to block any rotation or translation of the stopper with respect to the container.

Claim 19. (Previously presented) Device according to claim 18, wherein the said click fit means on the inner surface of the attachment ring and on the inner surface of the groove in the container are splines or slots.

Claim 20. Cancelled

Claim 21. Cancelled

Claim 22. (Previously presented) Device according to claim 1, wherein the amplitude of the opening angle controlled by the mechanical assistance means is not more than 160° .

Claim 23. (Previously presented) Device according to claim 1, wherein the angular deformation of the mechanical assistance means in the form of a bracket between a closed position and an open position is between 0° and not more than 30°.

Claim 24. (Previously presented) Device according to claim 1, wherein said device is made from thermoplastic polymer composition selected from the group consisting of polyethylenes (PE), polypropylenes (PP), ethylene / propylene copolymers and blends of them, polyamides (PA), polystyrenes (PS), acrylonitrile-butadiene-styrene (ABS) copolymers, styrene-acrylonitrile (SAN) copolymers, polyvinyl chlorides (PVC), polycarbonates (PC), polymethyl methacrylate (PMMA), and polyethylene terephthalates (PET) used alone or mixed.

Claim 25. (Previously presented) Device according to claim 24, wherein at least one natural or synthetic thermoplastic elastomer is associated with the thermoplastic compositions, the elastomer used being selected from the group consisting of natural rubber or synthetic rubber type elastomers, and rubbers based on mono-olefins, diolefin rubbers, rubbers based on condensation products, thermoplastic rubbers, silicones, styrenic rubbers, styrene-butadiene-styrene (SBS) and styrene-isoprene-styrene (SIS).

Claim 26. (Previously presented) Device according to claim 1 wherein said device is made in a single part according to plastics methodologies.

Claim 27. (Previously presented) A method for leak-tight sealing and ambient air purification treatment of packaging containers for products sensitive to gaseous pollutants comprising utilizing a device according to claim 1.

Claim 28. (Previously presented) Device according to claim 24, wherein at least one natural or synthetic thermoplastic elastomer is associated with the thermoplastic compositions, the elastomer being at least one selected from the group composed consisting of isobutene / isoprene polymers, ethylene vinyl acetate (EVA), ethylene-propylene (EPR), ethylene-propylene-diene (EPDM), ethylene-acrylic esters (EMA-EEA), fluorinated polymers, polybutadienes, styrene-butadiene (SBR) copolymers, polyester, polyurethane, thermoplastic rubbers, silicones, styrenic rubbers, styrene-butadiene-styrene (SBS) and styrene-isoprene-styrene (SIS).

Claim 29. (New) The device of claim 1 further comprising a means for packaging an ambient air treatment agent on its inner face, wherein a second wall of the male type stopper-cap internal to the first wall forms the packaging means for an ambient air treatment.